

AMENDMENTS TO THE CLAIMS:

Please cancel claims 1-16, and add new claims 17-36. This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1.-16. (Cancelled)

17. (New) An electrode system for an electrochemical cell, comprising:
a substrate formed of an electrically conducting material and pierced on at least one surface by a regular array of cavities;
a measurement electrode associated with the substrate, the measurement electrode being formed from a plurality of connected and electrically conducting microdisks that are contained within the cavities; and
a generator electrode associated with the substrate, the generator electrode being formed from an electrically conducting plate pierced by circular apertures having a diameter that is larger than a diameter of the microdisks and placed so that at least one of the apertures is concentric with at least one of the microdisks.

18. (New) The electrode system according to claim 17, further comprising an electrically insulating layer formed on the substrate and pierced by a plurality of circular apertures that are centered on the cavities and have a diameter that is smaller than a diameter of the cavities.

19. (New) The electrode system according to claim 18, wherein the microdisks further comprise a thin metallization formed on a bottom of each of the cavities, the thin metallization having substantially a same or smaller diameter as that of the apertures of the insulating layer, and further wherein the microdisks, optionally, include a thick metallization at least partly filling the rest of each of the cavities.

20. (New) The electrode system according to claim 19, wherein the thin metallization comprises a multilayer formed from an adhesion layer and a conducting layer.

21. (New) The electrode system according to claim 20, wherein the adhesion layer comprises titanium and the conducting layer comprises platinum.

22. (New) The electrode system according to claim 19, wherein the thick metallization comprises an electroplatable material, such as gold, platinum, or copper.

23. (New) The electrode system according to claim 20, wherein the thick metallization comprises an electroplatable material, such as gold, platinum, or copper.

24. (New) The electrode system according to claim 19, wherein the thick metallization is flush with an upper face of the substrate.

25. (New) The electrode system according to claim 19, wherein the thick metallization is covered with an active layer that is flush with an upper surface of the substrate.

26. (New) The electrode system according to claim 17, wherein the generator electrode comprises conducting diamond.

27. (New) The electrode system according to claim 18, wherein the generator electrode comprises conducting diamond.

28. (New) The electrode system according to claim 19, wherein the generator electrode comprises conducting diamond.

29. (New) The electrode system according to claim 17, wherein the generator electrode has a thickness allowing it to constitute, around and above the microdisks, a confinement volume protected from a hydrodynamic flow of a solution to be treated.

30. (New) The electrode system according to claim 18, wherein the generator electrode has a thickness allowing it to constitute, around and above the microdisks, a confinement volume protected from a hydrodynamic flow of a solution to be treated.

31. (New) The electrode system according to claim 19, wherein the generator electrode has a thickness allowing it to constitute, around and above the microdisks, a confinement volume protected from a hydrodynamic flow of a solution to be treated.

32. (New) The electrode system according to claim 17, wherein the substrate comprises electrically conductive doped silicon.

33. (New) A process for producing a measurement electrode of an electrode system for an electrochemical cell, comprising:

- providing a conducting substrate;
- depositing an insulating layer on a surface of the substrate;
- forming a mask provided with an array of circular apertures on the insulating layer, such that an arrangement and diameter of the array corresponds to a diameter of an array of microdisks;
- etching the insulating layer through the mask to form circular apertures in the insulating layer corresponding to the array;
- etching the substrate through the circular apertures to form cavities;
- depositing thin metallizations on a bottom surface of each of the cavities; and
- depositing thick metallizations on the thin metallizations.

34. (New) The process according to claim 33, wherein the insulating layer and the substrate are etched by plasma etching.

35. (New) The process according to claim 33, wherein the thin metallizations are deposited by vacuum evaporation.

36. (New) The process according to claim 33, wherein the thick metallizations are deposited by galvanic growth.